

# Influence of Anthropogenic Factor on Nature and Measures of Improvement

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**Abstract:** *Over the past years in the Republic of Karakalpakstan, water shortages are often repeated, and according to the forecasts of international experts, this phenomenon can be repeated in the future. As a result, a large part of the Aral Sea dried up which occupied the fourth place among the lakes and was with a volume of about 5.5 million hectares. The weather and climate conditions have changed a lot, and the general ecological condition has worsened. Under the leadership of the President of the Republic of Uzbekistan Sh.M. Since 2017, Mirziyoyeva in the area of environmental disaster began charity work on the development and landscaping of the empty bottom of the Aral Sea which gives excellent results.*

**Keywords:** Karakalpakstan; ecology; water shortage; salted; drought; Aral Sea; Amu Darya; Syr Darya; irrigation water; mineralization

## 1. Introduction

The Aral Sea, which belonged to Uzbekistan and Kazakhstan, ranked fourth among the lakes and therefore it was called the sea. It was fed by the waters of two large Central Asian rivers - the Amu Darya and Syr Darya. The mark of the water surface of the Aral Sea was almost 80 m above the level of the Caspian Sea. It was 428 km long and 234 km wide, with a maximum depth of 69 m and a volume of 1064 km<sup>3</sup>.

Aral Sea served as a climate control pond and mitigated extreme weather fluctuations throughout the region. Air masses that invaded the region warmed up in the winter and cooled over the sea in the summer.

## 2. Materials and Methods

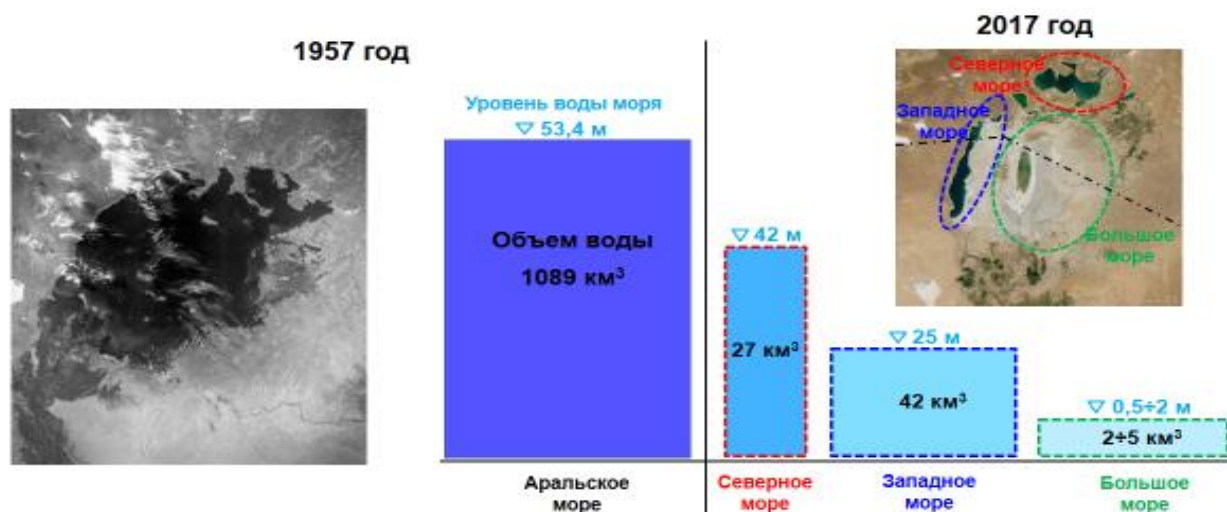
The main method was a statistical mathematical calculation method. According to international experts, by 2050 the volume of river flow in the Amu Darya river basin may be reduced by another 10-15% and the Syr Darya by 2-5%. The number of dry years and the number of years with a drought will increase with a loss of runoff up to 25-40%, which will cause a sharp increase in water demand and a tightening of water shortages. The results of many years of analysis show that, in the wet years from 1960 to 1970. 41-42.5 km<sup>3</sup> per year (acute for five-year periods) entered the sea, and from 1980 to 2010. excluding 2005 and 2010 the flow of water into the great sea has virtually ceased. During

the last period from 1998 to 2010, 2010 was the most busy year. By analyzing the water management situation in the Syrdarya and Amudarya river basins, it is possible to make predictive studies on the expected volumes of water inflow in the Aral Sea along the Amudarya River. If the demand for water is not resolved, this can cause crop loss, which, with population growth, will pose a serious risk to food security.

The total area of irrigated land that takes water from the Amu Darya increased from 3.2 million hectares in 1913. up to 6.9 million hectares in 1985, including Kyrgyzstan - 5% of the total amount of irrigated land. Until 1960, water withdrawal for all needs of the region did not exceed 63 km<sup>3</sup>, after 1980, using water from Afghanistan and Iran amounted to about 95.0 km<sup>3</sup>. After the construction of large canals, water was transferred from the Amu Darya and Syr Darya to deserts and semi-deserts. Along the canals, the groundwater level has risen sharply. Salinized lands were washed - water consumption was also increased.

## 3. Research Results

We cite the demographic factor - the population of the Aral Sea region began to grow sharply from 14 million (1960) to 65 million people (Uzbekistan, Turkmenistan, Tajikistan, Kyrgyzstan, Kazakhstan and some parts of Afghanistan). Excessive wetting of irrigated lands at one time led to an increase in the level of groundwater, which resulted in the discharge of highly mineralized drainage water into the Amu Darya and Syr Darya.



Picture 1: Aral Sea water level decrease

Recently, toxic salts from the Aral region were found on the peaks of the Pamir Mountains, the coast of Antarctica, in the glaciers of Greenland, forests of Norway and many other parts of the globe. The productivity of the main pastures decreases. The local climate in the Aral Sea has changed. As a result, due to negligence, humanity appeared Aralkum desert with an area of 5.5 million hectares.

There is a decrease and disappearance of wild, expensive and medicinal plant and animal species. Previously, the Aral Sea region was considered a region with a wide variety of flora and fauna. If in the Aral region earlier the number of saigas reached 1 million heads, the floristic composition was 638 species of higher plants, by the end of 2019, most species had disappeared. On the verge of complete extinction were 12 species of mammals, 26 species of birds and 11 species of plants.

Until the 1960s, the Aral Sea was the largest fishery reservoir in Central Asia with an annual catch of up to 40 thousand tons of fish.

The construction of the world's largest artificial canal - the Karakum and the creation of huge irrigated tracts throughout Central Asia - was proclaimed a victory over the desert! However, 40 years later, nature avenged mankind - created a new desert - Aralkum.

Today, the mirror area of the remains of the Aral Sea is less than 10% of the 1960 level. The volume of water decreased by almost 40 times. By 2050, the volume of river flow in the Amudarya river basin will decrease by 10-15% and the Syr Darya by 2-5%. The number of dry years and the number of years with a drought will increase with a loss of runoff up to 25-40%, which will cause a sharp increase in water demand and a tightening of water shortages. Failure to meet water demand could result in crop loss, which, with demographic growth, would pose a serious risk to food security.

Since the 1990s, Kazakhstan and Uzbekistan, from the rostrum of the United Nations and other international and regional organizations, have constantly attracted the attention of the world community to the Aral Sea problem and its close relationship with regional and global security

issues. "Having seen the consequences of the ecological crisis in the region, UN Secretary-General Ban Ki-moon said, "I have personally witnessed the complexity of the ecological situation in the Aral Sea region. This is a serious warning to all of humanity. This global problem must be addressed jointly by all the states of the region." When arriving in Karakalpakstan, UN Secretary General Antoni Guterres said that "May the Aral Sea be a symbol of the destruction of the planet by humanity, and let this be a lesson for all of us, to mobilize the entire international community in the implementation of the Paris climate agreement ... so that tragedies like that what I saw in Uzbekistan did not happen again." At present, the Aral Sea as a single body of water does not exist. Instead of the need for water at 5.5-6 km<sup>3</sup> per year and for low-water - 4.5 km<sup>3</sup>, in fact, only no more than 4 km<sup>3</sup> per year is provided, and in low-water it drops to 1.2 km<sup>3</sup>. Highly mineralized water, salinity reaches up to 312 grams per liter.

The contradiction continues between the irrigation regime of water use by the countries of the lower reaches of neighboring states such as Uzbekistan, Kazakhstan, Turkmenistan and the energy use of rivers by the countries of the upper reaches (Tajikistan, Kyrgyzstan). President of the Republic of Uzbekistan Shavkat Mirziyoyev To overcome the effects of the drying up of the sea, today it requires the active consolidation of international efforts. According to this, by decree of the President of the Republic of Uzbekistan dated October 16, 2018 No. PP-3975, the first one was created - the International Innovation Center of the Aral Sea region; the second is the Aral Innovation Support Fund; the third, the most combustible point of the Aral disaster is the Muynak Research and Production Site. The main tasks and priorities that were - innovations in research, technology transfer and organization of events in saline environments of the Aral Sea region; organization of cooperation with international organizations; development of public-private partnerships in the field of overcoming the consequences of the drying up of the Aral Sea and ecological improvement of the Aral Sea region. innovations in research, technology transfer and event organization in saline environments of the Aral Sea region; organization of work on cooperation with international organizations; development of public-private partnerships in the field of

overcoming the consequences of the drying up of the Aral Sea and ecological improvement of the Aral Sea region. Monitoring of the drained bottom of the Aral Sea. The aim of the project is to organize continuous monitoring of the state of the delta and the dried bottom of the Aral Sea using space observations and ground expeditions.

Under the personal leadership of the President of the Republic of Uzbekistan Sh.M. Starting in 2017, Mirziyoyev in the area of environmental disaster began charity work on the development and landscaping of the drained bottom of the Aral Sea. For this purpose, the Aral Sea region is developing forest plantations with sowing drought tolerant trees (saxaul, selenium, chogon, artemia, etc.).



**Picture 2:** Initial work on the development and landscaping of the drained bottom of the Aral Sea

#### 4. Brief Conclusions

- 1) Summarizing the results of the situation, we can conclude that the current supply of water from the Amu Darya and collectors is extremely unstable and does not provide constant flooding of water bodies and wetlands in the Amu Darya delta.
- 2) It is advisable to establish continuous systematic monitoring with an innovative approach to water accounting (water flow in canals, collectors and water level in lakes) and improving the system of hydrological forecasts of water flow into the Amu Darya River Delta. In this case, an information-analytical monitoring system will be created in the online mode of local water bodies of the Aral Sea region.
- 3) An ICWC decision is required to review the priority of delta water supply, especially in dry years.
- 4) In order to provide the population with high-vitamin products during the year in the Aral Sea region, it is necessary to create energy-efficient sun-heated greenhouses for growing lemon, herbs and agricultural crops near water sources to connect them to water and electricity.
- 5) It is necessary to train specialists with higher education and masters (geobotanists, land surveyors, soil scientists, geographers, ecologists, geologists and others).
- 6) Modernization of the mechanisms of hydrological regulation of the danger of dysfunction of water management systems and complexes. Develop a strategy for managing water resources in emergency and conflict situations. Introduce water-saving technologies into production, like Izrail technology and other water-saving factors.
- 7) Management of wetland ecosystems and coastal corridors of the Aral Basin is necessary to support sustainable livelihoods.
- 8) Crops of medicinal plants, like licorice, which are valuable for pharmaceuticals, as well as breeding a flock of small cattle.



**Picture 3:** Licorice



**Picture 4:** Newly formed pasture

#### References

- [1] Disasiyer by Design: Aral Sea Suslainability and its lessons. Prof. Michael
- [2] Edelstein, A sir id Cyerny, Abror Gadaev, UK, London 2012
- [3] UN report on the development of society "What lies behind the lack of water: Power, poverty and the global crisis of water resources" • M. : "The World" -2006.